

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND PROCESS OF  
PRODUCTION AND WRITE METHOD THEREOF

5

ABSTRACT OF THE DISCLOSURE

A nonvolatile semiconductor memory device  
featuring a reducing operating voltage while maintaining  
a good disturbance characteristic and high speed in a  
10 write operation, including a gate insulating film and  
gate electrode stacked on a channel forming region of a  
semiconductor provided on the surface of a substrate and  
planarly dispersed charge storing means such as carrier  
traps in a nitride film or near the interface with the  
15 top insulating film, provided in the gate insulating  
film, the gate insulating film including an FN tunnel  
film having a dielectric constant larger than that of a  
silicon oxide film and exhibiting an FN  
electroconductivity, whereby the thickness of the gate  
20 insulating film, converted to that of a silicon oxide  
film, can be reduced and the voltage can be reduced.  
Further, to reduce the operation voltage, ~~it is possible~~  
~~to provide~~ a pull-up electrode <sup>is provided</sup> near the gate electrode  
through the dielectric film and <sup>a</sup> pull-up gate bias circuit  
25 supplying a predetermined voltage to the same and boost

09431075 110109

A  
A  
A

the gate electrode by capacity coupling.

004431076 110109